

**RULES
OF
TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
TENNESSEE WATER QUALITY CONTROL BOARD
DIVISION OF WATER POLLUTION CONTROL**

**CHAPTER 1200-4-3
GENERAL WATER QUALITY CRITERIA**

TABLE OF CONTENTS

1200-4-3-.01	Tennessee Water Quality Control Board	1200-4-3-.09	Site Specific Impaired Classification Petition Process
1200-4-3-.02	General Considerations	1200-4-3-.10	Remediation of Ground Water or Perched Water
1200-4-3-.03	Criteria For Water Uses	1200-4-3-.11	Classified Site Specific Impaired Ground Water and Respective Criteria
1200-4-3-.04	Definitions	1200-4-3-.12	Reporting Requirement
1200-4-3-.05	Interpretation of Criteria		
1200-4-3-.06	Tennessee Antidegradation Statement		
1200-4-3-.07	Ground Water Classification		
1200-4-3-.08	Criteria		

1200-4-3-.01 TENNESSEE WATER QUALITY CONTROL BOARD.

The Water Quality Control Act, T.C.A., §69-3-101, et seq., makes it the duty of the Water Quality Control Board to study and investigate all problems concerned with the pollution of the Waters of the State and with its prevention, abatement, and control; and to establish such standards of quality for any Waters of the State in relation to their reasonable and necessary use as the Board shall deem to be in the public interest; and establish general policies relating to pollution as the Board shall deem necessary to accomplish the purposes of the Act. The following general considerations and criteria shall be used to determine the permissible conditions of waters with respect to pollution and preventative or corrective measures required to control pollution in various waters or in different sections of the same waters.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

1200-4-3-.02 GENERAL CONSIDERATIONS.

- (1) Tennessee water quality standards shall consist of the General Water Quality Criteria and the Antidegradation Statement found in Rule 1200-4-3, and the Use Classifications for Surface Waters found in Rule 1200-4-4.
- (2) Waters have many uses which in the public interest are reasonable and necessary. Such uses include: sources of water supply for domestic and industrial purposes; propagation and maintenance of fish and other aquatic life; recreation in and on the waters including the safe consumption of fish and shellfish; livestock watering and irrigation; navigation; generation of power; propagation and maintenance of wildlife; and the enjoyment of scenic and aesthetic qualities of waters.
- (3) The rigid application of uniform water quality is not desirable or reasonable because of the varying uses of such waters. The assimilative capacity of a stream for sewage and waste varies depending upon various factors and including the following: volume of flow, depth of channel, the presence of falls or rapids, rate of flow, temperature, natural characteristics, and the nature of the stream.

(Rule 1200-4-3-.02, continued)

- (4) In order to permit the reasonable and necessary uses of the Waters of the State, existing pollution should be corrected as rapidly as practicable, and future pollution prevented through the best available technology economically achievable or that greater level of technology necessary to meet water quality standards; i.e., modeling and stream survey assessments, treatment plants or other control measures.
- (5) Since all Waters of the State are classified for more than one use, the most stringent criteria will be applicable. In cases where criteria for protection of more than one use apply at different stream flows (e.g., aquatic life versus recreation), the most protective will also be applicable.
- (6) Waters identified as wet weather conveyances according to the definition found in 1200-4-3-.04 (4), shall be protective of humans and wildlife that may come in contact with them and shall not adversely affect the quality of downstream waters. Applicable water quality standards will be maintained downstream of wet weather conveyances.
- (7) Where general water quality criteria are applied on a regional, ecoregional, or subcoregional basis, these criteria will be considered to apply to a stream if eighty percent of its watershed or catchment is contained within the unit upon which the criterion is based.
- (8) All fish and aquatic life metals criteria are expressed as total recoverable, except cadmium, copper, lead, nickel, silver, and zinc which are expressed as dissolved. Translators will be used to convert the dissolved fraction into a total recoverable permit limit. One of three approaches to metals translation will be used: (1) translator is the same as the conversion factor, (2) translator is based on relationships derived from STORET data, (3) a site-specific translator is developed. Where available, a site-specific translator is preferred. For assessing whether criteria for cadmium, copper, lead, nickel, silver, and zinc are exceeded by ambient water quality conditions, the dissolved criteria will also be translated in order to allow direct comparison to the ambient data, if total recoverable.
- (9) Site-specific criteria studies may be conducted on any appropriate fish and aquatic life criteria.
 - (a) Site-specific criteria studies based on a Water Effects Ratio (WER) calculated from the documented toxicity of a parameter in the stream in which it will be introduced may supersede the adopted criteria at a site. The Division shall approve a site-specific criteria developed by others provided that the WER methodology [Interim Guidance on Determination and Use of Water-effect Ratios for Metals (EPA-823-B-94-001)] is used, both the study plan and results are approved by the department, and the U.S. Environmental Protection Agency has concurred with the final site specific criterion value(s).
 - (b) Any site specific criterion based on methodologies other than the WER methodology which recalculate specific criterion, such as the Resident Species Method or the Recalculation Method, must be adopted as a revision to Tennessee water quality standards into Chapter 1200-4-3, and following EPA approval, can be used for Clean Water Act purposes.

References on this subject include, but are not limited to: Technical Support Document for Water Quality-based Toxics Control (EPA - 505/2-90-001); Technical Guidance Manual for Performing Waste Load Allocations: Book VIII (EPA/600/6-85/002a/002b/002c); MinteqA2, An Equilibrium Metal Speciation Model (EPA/600/3-87/012); Water Quality Standards Handbook, Second Edition (EPA-823-B-93-002); The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit From a Dissolved Criteria (EPA-823-B-96-007); Interim Guidance on Determination and Use of Water-effect Ratios for Metals (EPA-823-B-94-001).

(Rule 1200-4-3-.02, continued)

- (10) Interpretation and application of narrative criteria shall be based on available scientific literature and EPA guidance and regulations.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

1200-4-3-.03 CRITERIA FOR WATER USES.

- (1) Domestic Water Supply.
- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
 - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
 - (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of domestic water supply.
 - (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
 - (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of domestic water supply.
 - (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes (See definition).
 - (g) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid-depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
 - (h) Coliform - The concentration of the E. coli group shall not exceed 630 per 100 ml as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purpose of determining the geometric mean, individual samples having an E. coli group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml.
 - (i) Taste or Odor - The waters shall not contain substances which will result in taste or odor that prevent the production of potable water by conventional water treatment processes.
 - (j) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, which will produce toxic conditions that materially

(Rule 1200-4-3-.03, continued)

affect the health and safety of man or animals, or impair the safety of conventionally treated water supplies. Available references include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended; and Federal Regulations under Section 1412 of the Public Health Service Act as amended by the Safe Drinking Water Act, (Public Law 93-523). Limits set for some of the most commonly occurring toxic substances are as follows:

Compound	Criteria (ug/L)	Compound	Criteria (ug/L)
Antimony	6	Diquat	20
Arsenic	10	Endothall	100
Beryllium	4	Glyphosate	700
Barium	2000	Hexachlorobenzene	1
Cadmium	5	Hexachlorocyclopentadiene	50
Chromium, total	100	Oxamyl (Vydate)	200
Lead	5	Picloram	500
Cyanide (as free cyanide)	200	Simazine	4
Mercury	2	2,3,7,8 TCDD (Dioxin)	0.00003
Nickel	100	Benzene	5
Selenium	50	Carbon tetrachloride	5
Thallium	2	1,2-Dichloroethane	5
Alachlor	2	1,1-Dichloroethylene	7
Atrazine	3	1,1,1-Trichloroethane	200
Carbofuran	40	Trichloroethylene	5
Chlordane	2	Vinyl chloride	2
Dibromo chloropropane	0.2	para-Dichlorobenzene	75
2,4 Dichlorophenoxyacetic	70	cis 1,2-Dichloroethylene	70
Ethylene dibromide	0.05	1,2-Dichloropropane	5
Heptachlor	0.4	Ethyl benzene	700
Heptachlor epoxide	0.2	Monochlorobenzene	100
Lindane	0.2	ortho-Dichlorobenzene	600
Methoxychlor	40	Styrene	100
Polychlorinated biphenyls	0.5	Tetrachloroethylene	5
2,4,5 Trichloropheno-		Toluene	1000
xyriponic acid	50	trans 1,2-Dichloroethylene	100
Pentachlorophenol	1	Xylenes, total	10000
Benzo(a)pyrene	0.2	Dichloromethane	5
Dalapon	200	1,2,4-Trichlorobenzene	70
Di(2-ethylhexyl) adipate	400	1,1,2-Trichloroethane	5
Di(2-ethylhexyl) phthalate	6	Endrin	2.0
Dinoseb	7	Toxaphene	3

- (k) Other Pollutants - The waters shall not contain other pollutants in quantities that may be detrimental to public health or impair the usefulness of the water as a source of domestic water supply.

(2) Industrial Water Supply.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.

(Rule 1200-4-3-.03, continued)

- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not appreciably impair the usefulness of the water as a source of industrial water supply.
 - (d) Total Dissolved Solids - The total dissolved solids shall at no time exceed 500 mg/l.
 - (e) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water as a source of industrial water supply.
 - (f) Turbidity or Color - There shall be no turbidity or color in amounts or characteristics that cannot be reduced to acceptable concentrations by conventional water treatment processes.
 - (g) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet or mid-depth, whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
 - (h) Taste or Odor - The waters shall not contain substances which will result in taste or odor that would prevent the use of the water for industrial processing.
 - (i) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances, which will adversely affect industrial processing.
 - (j) Other Pollutants - The waters shall not contain other pollutants in quantities that may adversely affect the water for industrial processing.
- (3) Fish and Aquatic Life.
- (a) Dissolved Oxygen - The dissolved oxygen shall not be less than 5.0 mg/l with the following exceptions.
 - 1. In streams identified as trout streams, including tailwaters, dissolved oxygen shall not be less than 6.0 mg/L.
 - 2. The dissolved oxygen concentration of trout waters designated as supporting a naturally reproducing population shall not be less than 8.0 mg/L. (Tributaries to trout streams or naturally reproducing trout streams should be considered to be trout streams or naturally reproducing trout streams, unless demonstrated otherwise. Additionally, all streams within the Great Smoky Mountains National Park should be considered naturally reproducing trout streams.)
 - 3. In wadeable streams in subcoregion 73a, dissolved oxygen levels shall not be less than a daily average of 5.0 mg/L with a minimum dissolved oxygen level of 4.0 mg/L.
 - 4. The dissolved oxygen level of streams in ecoregion 66 (Blue Ridge Mountains) not designated as naturally reproducing trout streams shall not be less than 7.0 mg/L.

Substantial and/or frequent variations in dissolved oxygen levels, including diurnal fluctuations, are undesirable if caused by man-induced conditions. Diurnal fluctuations

(Rule 1200-4-3-.03, continued)

shall not be substantially different than the fluctuations noted in reference streams in that region.

In lakes and reservoirs, the dissolved oxygen concentrations shall be measured at mid-depth in waters having a total depth of ten feet or less, and at a depth of five feet in waters having a total depth of greater than ten feet and shall not be less than 5.0 mg/L.

- (b) pH - The pH value shall not fluctuate more than 1.0 unit over a period of 24 hours and shall not be outside the following ranges: 6.0 – 9.0 in wadeable streams and 6.5 – 9.0 in larger rivers, lakes, reservoirs, and wetlands.
- (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to fish and aquatic life.
- (d) Turbidity, Total Suspended Solids, or Color - There shall be no turbidity, total suspended solids, or color in such amounts or of such character that will materially affect fish and aquatic life. In wadeable streams, suspended solid levels over time should not be substantially different than conditions found in reference streams.
- (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of recognized trout waters shall not exceed 20°C. There shall be no abnormal temperature changes that may affect aquatic life unless caused by natural conditions. The temperature in flowing streams shall be measured at mid-depth.

The temperature of impoundments where stratification occurs will be measured at mid-depth in the epilimnion (see definition in 1200-4-3-.04) for warm water fisheries and mid-depth in the hypolimnion (see definition in 1200-4-3-.04) for cold water fisheries. In the case of large impoundments (100 acres or larger) subject to stratification and recognized as trout waters, the temperature of the hypolimnion shall not exceed 20°C.

A successful demonstration as determined by the state conducted for thermal discharge limitations under Section 316(a) of the Clean Water Act, (33 U.S.C. §1326), shall constitute compliance with this section.

- (f) Taste or Odor - The waters shall not contain substances that will impart unpalatable flavor to fish or result in noticeable offensive odors in the vicinity of the water or otherwise interfere with fish or aquatic life. References include, but are not limited to: Quality Criteria for Water (section 304(a) of Public Law 92-500 as amended).
- (g) Toxic Substances - The waters shall not contain substances or a combination of substances including disease - causing agents which, by way of either direct exposure or indirect exposure through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), physical deformations, or restrict or impair growth in fish or aquatic life or their offspring. References on this subject include, but are not limited to: Quality Criteria for Water (Section 304(a) of Public Law 92-500 as amended); Federal Regulations under Section 307 of Public Law 92-500 as amended. The following criteria are for the protection of fish and aquatic life:

Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
----------	--	---

(Rule 1200-4-3-.03, continued)

Arsenic (III)*	340	150
Cadmium**	2.0	0.25
Chromium, III**	570	74
Chromium, VI*	16	11
Copper**	13	9.0
Compound	Criterion Maximum Concentration ug/l (CMC)	Criterion Continuous Concentration ug/l (CCC)
Lead**	65	2.5
Mercury*	1.4	0.77
Nickel**	470	52
Selenium	20	5
Silver**	3.2	---
Zinc**	120	120
Cyanide***	22	5.2
Chlorine (TRC)	19	11
Pentachlorophenol****	19	15
Aldrin	3.0	---
g-BHC – Lindane	0.95	---
Chlordane	2.4	0.0043
4-4'-DDT	1.1	0.001
Dieldrin	0.24	0.056
a-Endosulfan	0.22	0.056
b-Endosulfan	0.22	0.056
Endrin	0.086	0.036
Heptachlor	0.52	0.0038
Heptachlor epoxide	0.52	0.0038
PCBs, total	---	0.014
Toxaphene	0.73	0.0002
Tributyltin (TBT)	0.46	0.072

* Criteria for these metals are expressed as dissolved.

** Criteria for these metals are expressed as dissolved and are a function of total hardness (mg/L). Hardness-dependent metals criteria may be calculated from the following (values displayed above correspond to a total hardness of 100 mg/l and may have been rounded):

$$\text{CMC (dissolved)} = \exp\{m_A[\ln(\text{hardness})] + b_A\} \text{ (CF)}$$

$$\text{CCC (dissolved)} = \exp\{m_C[\ln(\text{hardness})] + b_C\} \text{ (CF)}$$

Chemical	M_A	b_A	M_C	B_C	Freshwater Conversion Factors (CF)	
					CMC	CCC
Cadmium	1.0166	-3.924	0.7409	-4.719	$1.136672 - [(\ln \text{hardness})(0.041838)]$	$1.101672 - [(\ln \text{hardness})(0.041838)]$
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	-1.700	0.8545	-1.702	0.960	0.960

(Rule 1200-4-3-.03, continued)

Lead	1.273	-1.460	1.273	-4.705	$1.46203 - [(\ln \text{hardness})(0.145712)]$	$1.46203 - [(\ln \text{hardness})(0.145712)]$
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	-6.59			0.85	
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

If criteria are hardness-dependent, the Criterion Maximum Concentration (CMC) and Criterion Continuous Concentration (CCC) shall be based on the actual stream hardness. When an ambient hardness of less than 25 mg/l is used to establish criteria for cadmium or lead, the hardness dependent conversion factor (CF) shall not exceed one. When ambient hardness is greater than 400 mg/l, criteria shall be calculated according to one of the following two options: (1) calculate the criterion using a default Water Effects Ratio (WER) of 1.0 and a hardness of 400 mg/l in the hardness based equation; or (2) calculate the criterion using a WER and the actual ambient hardness of the surface water in the hardness based equation. For information concerning metals translation and site-specific criteria, see 1200-4-3-.02 (9).

*** If Standard Methods 4500-CN I (Weak Acid Dissociable), 4500-CN G (Cyanides Amenable to Chlorination after Distillation), or OIA-1677 are used, this criterion may be applied as free cyanide.

**** Criteria for pentachlorophenol are expressed as a function of pH. Values displayed above correspond to a pH of 7.8 and are calculated as follows:

$$\text{CMC} = \exp(1.005(\text{pH}) - 4.869) \quad \text{CCC} = \exp(1.005(\text{pH}) - 5.134)$$

- (h) Other Pollutants - The waters shall not contain other pollutants that will be detrimental to fish or aquatic life.
- (i) Iron – The waters shall not contain iron at concentrations that cause toxicity or in such amounts that interfere with habitat due to precipitation or bacteria growth.
- (j) Ammonia – The one-hour average concentration of total ammonia nitrogen (in mg N/L) shall not exceed the CMC (acute criterion) calculated using the following equations:

Where salmonid fish are present:

$$\text{CMC} = \frac{0.275}{1 + 10^{7.204 - \text{pH}}} + \frac{39.0}{1 + 10^{\text{pH} - 7.204}}$$

Or where salmonid fish are not present:

$$\text{CMC} = \frac{0.411}{1 + 10^{7.204 - \text{pH}}} + \frac{58.4}{1 + 10^{\text{pH} - 7.204}}$$

The thirty-day average concentration of total ammonia nitrogen (in mg N/L) shall not exceed the CCC (chronic criterion) calculated using the following equations:

(Rule 1200-4-3-.03, continued)

When fish early life stages are present:

$$CCC = \left[\frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}} \right] \cdot \text{MIN} (2.85, 1.45 \cdot 10^{0.028 \cdot (25 - T)})$$

When fish early life stages are absent:

$$CCC_{(T, T)} = \left[\frac{0.0577}{1 + 10^{7.688 - \text{pH}}} + \frac{2.487}{1 + 10^{\text{pH} - 7.688}} \right] \cdot 1.45 \cdot 10^{0.028 \cdot (25 - \text{MAX}(T, 7))}$$

In addition, the highest four-day average within the 30-day period shall not exceed 2.5 times the CCC.

- (k) Nutrients - The waters shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that aquatic habitat is substantially reduced and/or the biological integrity fails to meet regional goals. Additionally, the quality of downstream waters shall not be detrimentally affected.

Interpretation of this provision may be made using the document Development of Regionally-based Interpretations of Tennessee's Narrative Nutrient Criterion and/or other scientifically defensible methods.

- (l) Coliform - The concentration of the E. coli group shall not exceed 630 per 100 ml as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having an E. coli group concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml. In addition, the concentration of the E. coli group in any individual sample shall not exceed 2,880 per 100 ml.
- (m) Biological Integrity - The waters shall not be modified through the addition of pollutants or through physical alteration to the extent that the diversity and/or productivity of aquatic biota within the receiving waters are substantially decreased or adversely affected, except as allowed under 1200-4-3-.06.

Interpretation of this provision for any stream which (a) has at least 80% of the upstream catchment area contained within a single bioregion and (b) is of the appropriate stream order specified for the bioregion and (c) contains the habitat (riffle or rooted bank) specified for the bioregion, may be made using the most current revision of the Department's Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys and/or other scientifically defensible methods.

Interpretation of this provision for all other Wadeable streams, lakes, and reservoirs may be made using Rapid Bioassessment Protocols for Use in Wadeable Streams and Rivers (EPA/841-B-99-002) or Lake and Reservoir Bioassessment and Biocriteria (EPA 841-B-98-007), and/or other scientifically defensible methods. Interpretation of this provision for wetlands or large rivers may be made using scientifically defensible methods. Effects to biological populations will be measured by comparisons to

(Rule 1200-4-3-.03, continued)

upstream conditions or to appropriately selected reference sites in the same bioregion if upstream conditions are determined to be degraded.

- (n) Habitat - The quality of stream habitat shall provide for the development of a diverse aquatic community that meets regionally-based biological integrity goals. Types of habitat loss include, but are not limited to: channel and substrate alterations, rock and gravel removal, stream flow changes, accumulation of silt, precipitation of metals, and removal of riparian vegetation. For wadeable streams, the instream habitat within each subcoregion shall be generally similar to that found at reference streams. However, streams shall not be assessed as impacted by habitat loss if it has been demonstrated that the biological integrity goal has been met.
 - (o) Flow – Stream or other waterbody flows shall support the fish and aquatic life criteria.
- (4) Recreation.
- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
 - (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
 - (c) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character that may be detrimental to recreation.
 - (d) Total Suspended Solids, Turbidity or Color - There shall be no total suspended solids, turbidity or color in such amounts or character that will result in any objectionable appearance to the water, considering the nature and location of the water.
 - (e) Temperature - The maximum water temperature change shall not exceed 3C° relative to an upstream control point. The temperature of the water shall not exceed 30.5°C and the maximum rate of change shall not exceed 2C° per hour. The temperature of impoundments where stratification occurs will be measured at a depth of 5 feet, or mid-depth whichever is less, and the temperature in flowing streams shall be measured at mid-depth.
 - (f) Coliform - The concentration of the E. coli group shall not exceed 126 colony forming units per 100 ml, as a geometric mean based on a minimum of 5 samples collected from a given sampling site over a period of not more than 30 consecutive days with individual samples being collected at intervals of not less than 12 hours. For the purposes of determining the geometric mean, individual samples having an E. coli concentration of less than 1 per 100 ml shall be considered as having a concentration of 1 per 100 ml.

Additionally, the concentration of the E. coli group in any individual sample taken from a lake, reservoir, State Scenic River, Exceptional Tennessee Water or ONRW (1200-4-3-.06) shall not exceed 487 colony forming units per 100 ml. The concentration of the E. coli group in any individual sample taken from any other waterbody shall not exceed 941 colony forming units per 100 ml.
 - (g) Taste or Odor - The waters shall not contain substances that will result in objectionable taste or odor.
 - (h) Nutrients - The waters shall not contain nutrients in concentrations that stimulate aquatic plant and/or algae growth to the extent that the public's recreational uses of the

(Rule 1200-4-3-.03, continued)

waterbody or other downstream waters are detrimentally affected. Unless demonstrated otherwise, the nutrient criteria found in 1200-4-3-.03(3)(k) will be considered adequately protective of this use.

- (i) Nutrient Response Criteria for Pickwick Reservoir: those waters impounded by Pickwick Dam on the Tennessee River. The reservoir has a surface area of 43,100 acres at full pool, 9,400 acres of which are within Tennessee. Chlorophyll a (corrected, as described in *Standard Methods for the Examination of Water and Wastewater*, 20th Edition, 1998): the mean of the photic-zone (See definition) composite chlorophyll a samples collected monthly April through September shall not exceed 18 µg/l, as measured over the deepest point, main river channel, dam forebay.
- (j) Toxic Substances - The waters shall not contain toxic substances, whether alone or in combination with other substances, that will render the waters unsafe or unsuitable for water contact activities including the capture and subsequent consumption of fish and shellfish, or will propose toxic conditions that will adversely affect man, animal, aquatic life, or wildlife. Human health criteria have been derived to protect the consumer from consumption of contaminated fish and water. The water and organisms criteria should only be applied to those waters classified for both recreation and domestic water supply. The criteria for recreation are as follows:

Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
<u>INORGANICS</u>		
Antimony	5.6	640
Arsenic (c)	10.0	10.0
Mercury	0.05	0.051
Nickel	610	4600
Thallium	0.24	0.47
Cyanide	140	140
 Dioxin **	 0.000001	 0.000001
<u>VOLATILES</u>		
Acrolein	190	290
Acrylonitrile (c)	0.51	2.5
Benzene (c)	22	510
Bromoform (c)	43	1400
Carbon tetrachloride (c)	2.3	16
Chlorobenzene	130	1600
Chlorodibromomethane (c)	4.0	130
Chloroform (c)	57	4700
Dichlorobromomethane (c)	5.5	170
1,2-Dichloroethane (c)	3.8	370
1,1-Dichloroethylene	330	7100
1,2-Dichloropropane (c)	5.0	150
1,3-Dichloropropene (c)	3.4	210
Ethylbenzene	530	2100
Methyl bromide	47	1500
Methylene chloride (c)	46	5900

(Rule 1200-4-3-.03, continued)

1,1,2,2-Tetrachloroethane (c)	1.7	40
Tetrachloroethylene (c)	6.9	33
Toluene	1300	15000
1,2-Trans-Dichloroethylene	140	10000
1,1,2-Trichloroethane (c)	5.9	160
Trichloroethylene (c)	25	300
Vinyl chloride (c)	0.25	24
	Water & Organisms Criteria *	Organisms Only Criteria
Compound	(ug/L)	(ug/L)
<u>ACID EXTRACTABLES</u>		
2-Chlorophenol	81	150
2,4-Dichlorophenol	77	290
2,4-Dimethylphenol	380	850
2-Methyl-4,6-dinitrophenol	13	280
2,4-Dinitrophenol	69	5300
Pentachlorophenol (c) (pH)	2.7	30
Phenol	21000	1700000
2,4,6-Trichlorophenol (c)	14	24
<u>BASE NEUTRALS</u>		
Acenaphthene	670	990
Anthracene	8300	40000
Benzidine (c)	0.00086	0.0020
Benzo(a)anthracene (c)	0.038	0.18
Benzo(a)pyrene (c)	0.038	0.18
Benzo(b)fluoranthene (c)	0.038	0.18
Benzo(k)fluoranthene (c)	0.038	0.18
Bis(2-Chlorethyl)ether (c)	0.30	5.3
Bis(2-Chloro-isopropyl)ether	1400	65000
Bis(2-Ethylhexyl)phthalate (c)	12	22
Butylbenzyl Phthalate	1500	1900
2-Chloronaphthalene	1000	1600
Chrysene (c)	0.038	0.18
Dibenz(a,h)Anthracene (c)	0.038	0.18
1,2-Dichlorobenzene	420	1300
1,3-Dichlorobenzene	320	960
1,4-Dichlorobenzene	63	190
3,3-Dichlorobenzidine (c)	0.21	0.28
Diethyl phthalate	17000	44000
Dimethyl phthalate	270000	1100000
Di-n-butyl phthalate	2000	4500
2,4-Dinitrotoluene (c)	1.1	34
1,2-Diphenylhydrazine (c)	0.36	2.0
Fluoranthene	130	140
Fluorene	1100	5300
Hexachlorobenzene (c)	0.0028	0.0029
Hexachlorobutadiene (c)	4.4	180
Hexachlorocyclopentadiene	40	1100
Hexachloroethane (c)	14	33
Ideno(1,2,3-cd)Pyrene (c)	0.038	0.18
Isophorone (c)	350	9600
Nitrobenzene	17	690

(Rule 1200-4-3-.03, continued)

N-Nitrosodimethylamine (c)	0.0069	30
N-Nitrosodi-n-Propylamine (c)	0.05	5.1
N-Nitrosodiphenylamine (c)	33	60
Pyrene	830	4000
1,2,4-Trichlorobenzene	35	70

Compound	Water & Organisms Criteria * (ug/L)	Organisms Only Criteria (ug/L)
<u>PESTICIDES</u>		
Aldrin (c)	0.00049	0.00050
a-BHC (c)	0.026	0.049
b-BHC (c)	0.091	0.17
g-BHC - Lindane	0.98	1.8
Chlordane (c)	0.0080	0.0081
4-4'-DDT (c)	0.0022	0.0022
4,4'-DDE (c)	0.0022	0.0022
4,4'-DDD (c)	0.0031	0.0031
Dieldrin (c)	0.00052	0.00054
a-Endosulfan	62	89
b-Endosulfan	62	89
Endosulfan Sulfate	62	89
Endrin	0.059	0.06
Endrin Aldehyde	0.29	0.30
Heptachlor (c)	0.00079	0.00079
Heptachlor epoxide (c)	0.00039	0.00039
PCB, total (c)	0.00064	0.00064
Toxaphene (c)	0.0028	0.0028

(c) 10^{-5} risk level is used for all carcinogenic pollutants.

* These criteria are for protection of public health due to consumption of water and organisms and should only be applied to these waters designated for both recreation and domestic water supply.

** Total dioxin is the sum of the concentrations of all dioxin and dibenzofuran isomers after multiplication by Toxic Equivalent Factors (TEFs). Following are the TEFs currently recommended by EPA (subject to revision):

DIOXIN ISOMERS	TEF	FURAN ISOMERS	TEF
Mono-, Di-, & TriCDDs	0.0	Mono-, Di-, & TriCDFs	0.0
2,3,7,8 TCDD	1.0	2,3,7,8 TCDF	0.1
Other TCDDs	0.0	Other TCDFs	0.0
2,3,7,8 PeCDD	0.5	1,2,3,7,8 PeCDF	0.05
Other PeCDDs	0.0	2,3,4,7,8 PeCDF	0.5
		Other PeCDFs	0.0
2,3,7,8 HxCDD	0.1	Other PeCDFs	0.0
Other HxCDDs	0.0	2,3,7,8 HxCDF	0.1
		Other HxCDFs	0.0

(Rule 1200-4-3-.03, continued)

2,3,7,8 HpCDD	0.01	2,3,7,8 HpCDF	0.01
Other HpCDDs	0.0	Other HpCDFs	0.0
OCDD	0.001	OCDF	0.001

- (k) Other Pollutants - The waters shall not contain other pollutants in quantities which may have a detrimental effect on recreation.
- (l) Fish Consumption Advisories - A public fishing advisory will be considered when the calculated risk of additional cancers exceeds 10^{-4} for typical consumers or 10^{-5} for atypical consumers (See definition). A "do not consume" advisory will be issued for the protection of typical consumers and a "precautionary advisory" will be issued for the protection of atypical consumers. The following formula will be used to calculate the risk of additional cancers :

$$R = qE$$

where:

R= Plausible-upper-limit risk of cancer associated with a chemical in a fisheries species for a human subpopulation.

q = Carcinogenic Potency Factor for the chemical ($\text{mg kg}^{-1} \text{ day}^{-1}$)⁻¹ estimated as the upper 95 percent confidence limit of the slope of a linear dose-response curve. Scientifically defensible Potency Factors will be used.

E = Exposure dose of the chemical ($\text{mg kg}^{-1} \text{ day}^{-1}$) from the fish species for the human subpopulation in the area. E is calculated by the following formula:

$$E = \frac{C \times I \times X}{W} \quad \text{where:}$$

C = Concentration of the chemical (mg/kg) in the edible portion of the species in the area. The average levels from multiple fillet samples of the same species will be used. Catfish will be analyzed skin-off with the belly flap included in the sample. Gamefish and carp will be analyzed skin-on with the belly flap included in the sample. Sizes of fish collected for analysis will represent the ranges of sizes likely to be collected and consumed by the public. References on this subject include, but are not limited to: EPA's Guidance for Assessing Chemical Contaminant Data for use in Fish Advisories.

I = Mean daily consumption rate (g/day averaged over 70 year lifetime) of the fish species by the human subpopulation in the area. 6.5 g/day will be used unless better site-specific information is available.

X = Relative absorption coefficient, or the ratio of human absorption efficiency to test animal absorption efficiency of the chemical. Assumed to be 1.0 unless better information is available.

W = Average human mass (kg). 75 kg will be used.

(Rule 1200-4-3-.03, continued)

For substances for which the public health concern is based on toxicity, a "do not consume" advisory will be considered warranted when average levels of the substance in the edible portion of fish exceed U.S. Food and Drug Administration (FDA) Action Levels or EPA national criteria. Based on the rationale used by FDA or EPA for their levels, the Commissioner may issue precautionary advisories at levels appropriate to protect sensitive populations.

(m) Flow – Stream flows shall support recreational uses.

(5) Irrigation.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for irrigation.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as may impair the usefulness of the water for irrigation purposes.
- (e) Temperature - The temperature of the water shall not interfere with its use for irrigation purposes.
- (f) Toxic Substances - The waters shall not contain toxic substances whether alone or in combination with other substances which will produce toxic conditions that adversely affect the quality of the waters for irrigation.
- (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for irrigation.

(6) Livestock Watering and Wildlife.

- (a) Dissolved Oxygen - There shall always be sufficient dissolved oxygen present to prevent odors of decomposition and other offensive conditions.
- (b) pH - The pH value shall lie within the range of 6.0 to 9.0 and shall not fluctuate more than 1.0 unit in this range over a period of 24 hours.
- (c) Hardness or Mineral Compounds - The hardness of or the mineral compounds contained in the water shall not impair its use for livestock watering and wildlife.
- (d) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with livestock watering and wildlife.
- (e) Temperature - The temperature of the water shall not interfere with its use for livestock watering and wildlife.
- (f) Toxic Substances - The waters shall not contain substances whether alone or in combination with other substances, which will produce toxic conditions that adversely affect the quality of the waters for livestock watering and wildlife.

(Rule 1200-4-3-.03, continued)

- (g) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the water for livestock watering and wildlife.
- (7) Navigation.
 - (a) Solids, Floating Materials and Deposits - There shall be no distinctly visible solids, scum, foam, oily slick, or the formation of slimes, bottom deposits or sludge banks of such size or character as to interfere with navigation.
 - (b) Other Pollutants - The waters shall not contain other pollutants in quantities which may be detrimental to the waters used for navigation.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

1200-4-3-.04 DEFINITIONS IN ADDITION TO THE MEANINGS PROVIDED IN THE WATER QUALITY CONTROL ACT (T.C.A. §§69-103), TERMS USED IN THESE RULES SHALL HAVE THE MEANINGS PROVIDED BELOW.

- (1) A typical consumers - Those persons in the vicinity of a stream or lake who due to physiological factors or previous exposure are more sensitive to specific pollutants than is the population in general. Examples of atypical consumers may include, but are not limited to: children; pregnant or nursing women; subsistence fishermen; frequent purchasers of commercially harvested fish; and agricultural, industrial, or military personnel who may have had previous occupational exposure to the contaminant of concern.
- (2) Conventional Water Treatment - Conventional water treatment as referred to in the criteria denotes coagulation, sedimentation, filtration, and chlorination or disinfection.
- (3) Degradation - The alteration of the properties of waters by the addition of pollutants or removal of habitat.
- (4) De Minimis – Alterations, other than those resulting in the condition of pollution or new domestic wastewater discharges, that represent either a small magnitude or a short duration shall be considered a de minimis impact and will not be considered degradation for purposes of implementing the antidegradation policy. Discharges other than domestic wastewater will be considered de minimis if they are temporary or use less than five percent of the available assimilative capacity for the substance being discharged. Water withdrawals will be considered de minimis if less than five percent of the 7Q10 flow of the stream is removed (the calculations of the low flow shall take into account existing withdrawals). Habitat alterations authorized by an Aquatic Resource Alteration Permit (ARAP) are de minimis if the division finds that the impacts are offset by a combination of impact minimization and/or in-system mitigation.

If more than one activity has been authorized in a segment and the total of the impacts uses no more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow, they are presumed to be de minimis. Where total impacts use more than ten percent of the assimilative capacity, available habitat, or 7Q10 low flow they may be treated as de minimis provided that the division finds on a scientific basis that the additional degradation has an insignificant effect on the resource and that no single activity is allowed to consume more than five percent of the assimilative capacity, available habitat or 7Q10 low flow.

(Rule 1200-4-3-.04, continued)

- (5) Ecoregion - A relatively homogeneous area defined by similarity of climate, landform, soil, potential natural vegetation, hydrology, or other ecologically relevant variables.
- (6) Epilimnion – The upper layer of water in a thermally stratified lake or reservoir. This layer consists of the warmest water and has a fairly uniform (constant) temperature.
- (7) Hypolimnion - The lowest layer in a thermally stratified lake or reservoir. This layer consists of colder, more dense water, has a constant temperature and no mixing occurs. The hypolimnion of a eutrophic lake is usually low or lacking in oxygen.
- (8) Mixing Zone - That section of a flowing stream or impounded waters in the immediate vicinity of an outfall where an effluent becomes dispersed and mixed.
- (9) Photic Zone - the region of water through which light penetrates and where photosynthetic organisms live.
- (10) Reference condition - A parameter-specific set of data from regional reference sites that establish the statistical range of values for that particular substance at least-impacted streams.
- (11) Reference Site - Least impacted waters within an ecoregion that have been monitored to establish a baseline to which alterations of other waters can be compared.
- (12) Stratification – The tendency in lakes and reservoirs for distinct layers of water to form as a result of vertical change in temperature and, therefore, in the density of water. During stratification, dissolved oxygen, nutrients, and other parameters of water chemistry do not mix well between layers, establishing chemical as well as thermal gradients.
- (13) Subecoregion - A smaller, more homogenous area that has been delineated within an ecoregion.
- (14) Thermocline – The middle layer in a thermally stratified lake or reservoir. In this layer there is a rapid decrease in temperature with depth. Also called the metalimnion.
- (15) Wadeable streams - Streams that can be sampled using a hand held, one meter square or smaller kick net without water and materials escaping over the top of the net.
- (16) Wet Weather Conveyances - Man-made or natural watercourses, including natural watercourses that have been modified by channelization, that flow only in direct response to precipitation runoff in their immediate locality and whose channels are above the groundwater table and which do not support fish or aquatic life and are not suitable for drinking water supplies. [T.C.A. § 4-5-202, T.C.A. § 69-3-105.]

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

1200-4-3-.05 INTERPRETATION OF CRITERIA.

- (1) Interpretation of the above criteria shall conform to any rules and regulations or policies adopted by the Water Quality Control Board.

(Rule 1200-4-3-.05, continued)

- (2) The effect of treated sewage or waste discharge on the receiving waters shall be considered beyond the mixing zone except as provided in this paragraph. The extent to which this is practicable depends upon local conditions and the proximity and nature of other uses of the waters. Such mixing zones (See definition) shall be restricted in area and length and shall not (i) prevent the free passage of fish or cause aquatic life mortality in the receiving waters; (ii) contain materials in concentrations that exceed acute criteria beyond the zone immediately surrounding the outfall; (iii) result in offensive conditions; (iv) produce undesirable aquatic life or result in dominance of a nuisance species; (v) endanger the public health or welfare; or (vi) adversely affect the reasonable and necessary uses of the area; (vii) create a condition of chronic toxicity beyond the edge of the mixing zone; (viii) adversely affect nursery and spawning areas; or (ix) adversely affect species with special state or federal status.
- (3) The technical and economical feasibility of waste treatment, recovery, or adjustment of the method of discharge to provide correction shall be considered in determining the time to be allowed for the development of practicable methods and for the specified correction, to the extent allowable under Rule 1200-4-3-.06 (5).
- (4) Water quality criteria for fish and aquatic life and livestock watering and wildlife set forth shall generally be applied on the basis of the following stream flows: unregulated streams - stream flows equal to or exceeding the 7-day minimum, 10-year recurrence interval; regulated streams - all flows in excess of the minimum critical flow occurring once in ten years as determined by the division. However, criteria that are wholly or partially based on direct measurements of ambient aquatic community health, such as the nutrient, biological integrity, and habitat criteria for the fish and aquatic life use, shall support the designated use. These criteria should be considered independent of a specified minimum flow duration and recurrence. All other criteria shall be applied on the basis of stream flows equal to or exceeding the 30 day minimum 5 year recurrence interval.
- (5) In general, deviations from normal water conditions are undesirable, but the magnitude and duration of the deviations shall be considered in interpreting the above criteria. When interpreting pathogen data, samples collected during or immediately after significant rain events may be treated as outliers unless caused by point source dischargers. Such outlier data may be given less weight in assessment decisions than non-rain event sampling results.
- (6) The criteria and standards provide that all discharges of sewage, industrial waste, and other waste shall receive the degree of treatment or effluent reduction necessary to comply with water quality standards, or state or federal laws and regulations pursuant thereto, and where appropriate will comply with the "Standards of Performance" as required by the Tennessee Water Quality Control Act, (T.C.A., §§69-3-101, et seq.).
- (7) Where naturally formed conditions (e.g., geologic formations) or background water quality conditions are substantial impediments to attainment of the water quality standards, these natural or background conditions shall be taken into consideration in establishing any effluent limitations or restrictions on discharges to such waters.
- (8) There are cases in which the in-stream criteria as established by this rule are less than current chemical technological capabilities for analytical detection. In instances where permit limits established through implementation of these criteria are below analytical capabilities, compliance with those limits will be determined using the following detection limits, unless in specific cases other detection limits are demonstrated to be the best achievable because of the particular nature of the wastewater being analyzed:

REQUIRED METHOD DETECTION LEVELS [RDL] (ug/l)
(Approved EPA Methods Must Be Used)

(Rule 1200-4-3-.05, continued)

<u>INORGANICS</u>	<u>RDL</u>	<u>BASE NEUTRALS</u>	<u>RDL</u>
Antimony	3.0	Acenaphthylene (c)	2.3
Arsenic, total (c)	1.0	Anthracene	0.7
Arsenic (III) (c)	1.0	Benzo(a)anthracene (c)	0.3
Beryllium (c)	1.0	Benzo(a)pyrene (c)	0.3
Cadmium	1.0	3,4-Benzofluoranthene (c)	0.3
Chromium, total	1.0	Benzo(k)fluoranthene (c)	0.3
Chromium (III)	1.0	Bis(2-Chloroethyl)ether (c)	1.0
Chromium (VI)	10.0	Bis(2-Ethylhexyl)phthalate(c)	2.5
Copper	1.0	Chrysene	2.5
Lead	1.0	1,2-Dichlorobenzene	2.0
Mercury	0.2	1,3-Dichlorobenzene	2.0
Nickel	10.0	1,4-Dichlorobenzene -	
Selenium	2.0	para-Dichlorobenzene	4.4
Silver	1.0	Diethyl phthalate	1.9
Zinc	1.0	Dimethyl phthalate	1.6
Cyanide	5.0	Di-n-Butyl phthalate	2.5
		2,4-Dinitrotoluene (c)	1.0
Dioxin		Fluoranthene	2.2
	0.00001		
<u>VOLATILES</u>		Fluorene	0.3
Acrolein	1.0	Hexachlorobenzene (c)	1.9
Acrylonitrile (c)	1.0	Hexachlorobutadiene (c)	5.0
Benzene (c)	1.0	Hexachloroethane (c)	0.5
Bromoform -		Nitrobenzene	10.0
Tribromomethane (c)	1.0	Phenanthrene	0.7
Carbon tetrachloride (c)	1.0	Pyrene	0.3
Chloroform -		<u>PESTICIDES</u>	
Trichloromethane (c)	0.5	Aldrin (c)	0.5
Dichlorobromomethane (c)	1.0	g-BHC - Lindane (c)	0.5
1,2-Dichloroethane (c)	1.0	Chlordane (c)	0.1
1,1-Dichloroethylene (c)	1.0	4,4'-DDT (c)	0.1
1,3-Dichloropropylene	1.0	4,4'-DDE (c)	0.1
Ethylbenzene	1.0	4,4'-DDD (c)	0.1
Methyl chloride -		Dieldrin (c)	0.05
Chloromethane (c)	1.0	a-Endosulfan	0.1
Methylene chloride -		b-Endosulfan	0.05
Dichloromethane (c)	1.0	Endrin	0.1
1,1,2,2-Tetrachloroethane (c)	0.5	Heptachlor (c)	0.05
Tetrachloroethylene (c)	0.5	Heptachlor epoxide (c)	0.08
Toluene	1.0	PCB-1242 (c)	0.5
1,1,1-Trichloroethane	1.0	PCB-1254 (c)	0.5
1,1,2-Trichloroethane (c)	0.2	PCB-1221 (c)	0.5
Trichloroethylene (c)	1.0	PCB-1232 (c)	0.5
Vinyl chloride (c)	2.0	PCB-1248 (c)	0.5
		PCB-1260 (c)	0.5
<u>ACID EXTRACTABLES</u>		PCB-1016 (c)	0.5
2-Methyl-4,6-dinitrophenol-		PCB, total (c)	0.5
4,6-Dinitro-o-cresol	24.0	Toxaphene (c)	0.5
2,4-Dinitrophenol	42.0		
Pentachlorophenol	5.0		
2,4,6-Trichlorophenol (c)	2.7	(c) - carcinogen	

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

(Rule 1200-4-3-.05, continued)

1200-4-3-.06 ANTIDEGRADATION STATEMENT.

- (1) It is the purpose of Tennessee's standards to fully protect existing uses of all surface waters as established under the Act. Existing uses are those actually attained in the waterbody on or after November 28, 1975. Additionally, the Tennessee Water Quality Standards shall not be construed as permitting the degradation (see definition) of high quality surface waters. Where the quality of Tennessee waters is better than the level necessary to support propagation of fish, shellfish, and wildlife, and recreation in and on the water, that quality will be maintained and protected unless the state finds, after intergovernmental coordination and public participation, that lowering water quality is necessary to accommodate important economic or social development in the area in which the waters are located.

Sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices. Activities that cause or contribute to non-compliance with a water quality standard will not be allowed. Activities proposed for waters that are not identified as either being Exceptional Tennessee Waters (1200-4-3-.06(4)) or Outstanding National Resource Waters (1200-4-3-.06(5)), will be evaluated on the basis of 1200-4-3-.06(2) and (3).

Where new or increased temperature alterations are proposed, a successful demonstration as determined by the state under Section 316(a) of the Clean Water Act, 33 U.S.C. §1326, shall be considered to be in compliance with this section.

- (2) Unavailable conditions exist where water quality is at, or fails to meet, the criterion for one or more parameters. In unavailable conditions, new or increased discharges of a substance that would cause or contribute to a condition of impairment will not be allowed. Where impairment by habitat alteration exists, additional significant loss of habitat within the same area of influence shall not be authorized unless avoidance, minimization, or in-system mitigation can render the impact de minimis.
- (3) Available conditions exist where water quality is better than the applicable criterion for a specific parameter. In available conditions, new or additional degradation for that parameter will only be allowed if the applicant has demonstrated to the department that reasonable alternatives to degradation are not feasible.
 - (a) Analysis of reasonable alternatives shall be part of the application process and shall include a discussion of the feasibility of all potential alternatives, plus the social and economic considerations and environmental consequences of each. Alternatives analyses shall include, at a minimum, completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. These forms are found in the EPA guidance document entitled Interim Economic Guidance for Water Quality Standards: Workbook (EPA 823/B-95-002) (Economic Guidance). Reasonable alternatives for the various activities include, but are not limited to the following actions.
 1. Alternatives for discharges include connection to an existing collection system, land application, water reuse, water recycling, or other treatment alternatives. For small domestic discharges, connection to an existing system or land application will be considered preferable.
 2. For water withdrawals, alternatives include water conservation, water reuse or recycling, off-stream impoundments, water harvesting during high flow conditions, regionalization, withdrawing water from a larger waterbody, use of

(Rule 1200-4-3-.06, continued)

- ground water, connection to another water supply with available capacity, and pricing structures that encourage a reduction in consumption.
3. For activities that cause habitat alterations, alternatives that minimize or avoid degradation should be explored and explained by the applicant. These avoidance or minimization activities could include maintaining or enhancing buffer zones, bridging a stream rather than culverting it, altering the footprint of a project instead of relocating a stream, or using a culvert without a bottom, instead of one that is fully concreted.
- (b) For authorized new or expanded discharges, a record of the antidegradation determination(s) will be maintained and will be available for public review. Public participation and intergovernmental coordination will be provided in conjunction with permitting activities.
- (4) (a) Exceptional Tennessee Waters are waters that are in any one of the following categories:
 1. Waters within state or national parks, wildlife refuges, forests, wilderness areas, or natural areas;
 2. State Scenic Rivers or Federal Wild and Scenic Rivers;
 3. Federally-designated critical habitat or other waters with documented non-experimental populations of state or federally-listed threatened or endangered aquatic or semi-aquatic plants, or aquatic animals;
 4. Waters within areas designated as Lands Unsuitable for Mining pursuant to the federal Surface Mining Control and Reclamation Act where such designation is based in whole or in part on impacts to water resource values;
 5. Waters with naturally reproducing trout;
 6. Waters with exceptional biological diversity as evidenced by a score of 40 or 42 on the Tennessee Macroinvertebrate Index (or a score of 28 or 30 in subecoregion 73a) using protocols found in TDEC's 2006 Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys, provided that the sample is considered representative of overall stream conditions; or
 7. Other waters with outstanding ecological, or recreational value as determined by the department. When application of this provision is a result of a request for a permit, such preliminary determination is to be made within 30 days of receipt of a complete permit application.
 - (b) The department will maintain a list of waterbodies that have been reviewed and are known to have one or more of the above characteristics on its website and will make paper copies of that list available upon request.
 - (c) In waters identified as Exceptional Tennessee Waters no degradation will be allowed unless and until it is affirmatively demonstrated to the Department, after full satisfaction of the following intergovernmental and public participation provisions, that a change is justified as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters. At the time of permit renewal, previously authorized discharges, including upstream discharges, which presently degrade Exceptional Tennessee Waters, will be subject to a review of updated alternatives analysis information provided by the applicant, but not to a determination of economic/social necessity. Public participation for these existing

(Rule 1200-4-3-.06, continued)

discharges will be provided in conjunction with permitting activities. Sources exempted from permit requirements under the Water Quality Control Act should utilize all cost-effective and reasonable best management practices.

- (d) Determination of Economic/Social Necessity - Where reasonable alternatives to degradation to an Exceptional Tennessee Water is not feasible, applicants may ask the Department to determine that the proposed degradation is justified on the basis of economic or social necessity. The applicant shall have the burden of establishing to the Department that a change is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any classified uses existing in such waters. The Department's determination that degradation is justified or unjustified shall be subject to review by the Water Quality Control Board under the following procedures.
 1. If the Department determines that degradation is justified, it will notify the applicant, the federal and state intergovernmental coordination agencies, and third persons who requested notification of the determination. Within 30 days after the date of the notification, any affected intergovernmental coordination agency or affected third person may petition the Board for a declaratory order under Tennessee Code Annotated § 4-5-223, and the Board shall convene a contested case. After the Board has convened a contested case in response to a declaratory order petition under this part, the Department shall within 5 business days thereafter transmit the petition to the Administrative Procedures Division of the Secretary of State so the contested case may be docketed and an administrative law judge may be assigned to the case. If a declaratory order petition is timely filed, the Department shall not proceed further in processing the permit application until the petition has been resolved before the Board. In the contested case, the petitioner shall have the burden of proof, and the Department's determination shall carry no presumption of correctness before the Board. The applicant is a necessary party to the declaratory order contested case, and if the applicant does not participate in the contested case, the Board shall render a decision that degradation is not justified. If no intergovernmental coordination agency or third person petitions for a declaratory order within 30 days of the notification date, then the Department shall proceed with processing the permit application.
 2. A declaratory order contested case conducted under this provision shall be subject to the following procedures. Mediation may occur if all the parties agree. Any proposed agreed order resulting from mediation shall be subject to approval by the Board. In order to provide for an expedited proceeding, the contested case is subject to the following time limitations. The time periods specified in this part shall commence on the day after the contested case has been docketed by the Administrative Procedures Division of the Secretary of State and an administrative law judge has been assigned to the case. Any alteration of the time periods set out in this part shall be granted only upon agreement of all the parties, or when there have been unforeseen developments that would cause substantial prejudice to a party, or when the parties have agreed to mediation. Within 20 days, the parties shall confer to try and develop a proposed agreed scheduling order. If the parties are unable to agree, then each party shall submit a proposed scheduling order, and the administrative law judge, after a hearing, shall enter a scheduling order. All discovery shall be completed no later than 20 days prior to the date the hearing before the Board is to begin. Within 120 days, the hearing before the Board shall begin, but the Board on its own initiative may exceed 120 days to complete the hearing and render its final decision. In order for degradation of Exceptional Tennessee Waters to proceed pursuant to these

(Rule 1200-4-3-.06, continued)

rules, the Board must make a finding approving degradation by a majority vote of the members of the Board present and voting.

3. If the Department determines that degradation is not justified, it will notify the applicant, the federal and state intergovernmental coordination agencies, and third persons who requested notification of the determination. The Department also will issue a tentative decision to deny the permit because degradation is not justified. In accordance with 1200-4-5-.06(4), the Department will provide the public with notice of and an opportunity to comment on its tentative denial decision. If no public hearing is requested within the 30 day public comment period, and if the Department does not alter its tentative decision to deny, the Department shall notify the applicant of its final decision to deny the permit because degradation is not justified. Within 30 days after receiving notice of the final decision to deny the permit, the applicant may seek review of the decision in a contested case before the Board in accordance with Tennessee Code Annotated § 69-3-105(i). Within 5 business days after the Department receives an applicant's written request for a contested case hearing before the Board, the Department shall transmit the written request to the Administrative Procedures Division of the Secretary of State so the contested case may be docketed and an administrative law judge may be assigned to the case. In the contested case, the applicant shall have the burden of proof, and the Department's determination shall carry no presumption of correctness before the Board. The federal and state intergovernmental coordination agencies, and third persons who requested notification of the Department's degradation determination will be notified by the Department of the applicant's permit appeal. The intergovernmental coordination agencies and third persons may seek to intervene in the contested case in accordance with Tennessee Code Annotated § 4-5-310.

(e) Information Requirements:

1. Applicants requesting an economic/social necessity determination to allow degradation under this provision must provide all information required in order for the Department to make a determination that reasonable alternatives to degradation are not feasible. Reasonable alternatives for discharges may include, but are not limited to, connection to an existing collection system, land application, water reuse, water recycling, or other treatment alternatives. Applicants for permit renewals of previously authorized discharges, including upstream discharges, which presently degrade Exceptional Tennessee Waters, shall submit as an alternatives analysis completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. If needed, the Department may request the applicant to provide additional information. Alternatives analysis for new or additional degradation shall include, at a minimum, completed and accurate Worksheets A and B for public sector applicants or Worksheets A and G for private system applicants, except where these worksheets are inappropriate for the activity, in which case applicants may substitute materials that provide equivalent information. These forms are found in the EPA guidance document (Economic Guidance).
2. Additionally, to provide information to the Department regarding the applicant's claim of economic/social necessity, public sector applicants shall complete and submit, at a minimum, Forms O, P, Q, S, T, U, and AA, found in the EPA guidance document (Economic Guidance). Private sector applicants shall complete and submit, at a minimum, Forms O, R, V, W, X, Y, Z, and AB, found in the EPA guidance document (Economic Guidance). In instances when these

(Rule 1200-4-3-.06, continued)

worksheets are inappropriate for the activity, those applicants may substitute materials that provide equivalent information.

(f) Public Participation:

1. NPDES - Applicants seeking permission to degrade Exceptional Tennessee Waters shall publish a notice in a newspaper of general distribution in the area of the degradation. The notice shall identify the proposed discharge, provide the specific location including affected waters, describe the general basis for requesting permission to degrade Exceptional Tennessee Waters, inform the public of their opportunity to provide comments, and that a local public meeting will be held by the Department unless the Department notifies the public of its determination that the discharge will not result in degradation. The applicant shall also post a sign within sight of a public road containing the same general information as the newspaper notice. A copy of the newspaper notice and proof of signage shall be provided to the Department. The public meeting held by the Department shall be near the proposed degradation.
2. ARAP/Section 401 Water Quality Certification - If the Department determines that an applicant's proposed activity will not result in degradation, it will so notify the public. If the Department determines that the proposed activity will degrade Exceptional Tennessee Waters, and the applicant intends to seek permission to do so, then the applicant shall publish a notice in a newspaper of general distribution in the area of the degradation. The notice shall identify the proposed activity, provide the specific location including affected waters, describe the general basis for requesting permission to degrade Exceptional Tennessee Waters, inform the public of their opportunity to submit comments, and that a local public meeting will be held by the Department. The public meeting held by the Department shall be near the proposed degradation.
3. Timing of Public Participation - Within 14 days of the Department being informed that an applicant will seek degradation, the applicant shall provide notice, as identified above, to the affected public. After the applicant provides public notice, the Department shall notify the public of the location, date and time of the public meeting in the area of degradation. Public notice by the Department shall occur at least 45 days prior to the meeting. For a proposed discharge, if the Department determines that the discharge will not result in degradation, it will so notify the public and in this circumstance, there will be no public meeting.

(g) Intergovernmental Coordination - A notice concerning the request for an economic/social necessity determination shall be provided by the Department to federal and state agencies with jurisdiction over fish, wildlife, shellfish, plant and wildlife resources, parks, and advisory councils for historic preservation.

- (5) The Department may recommend to the Water Quality Control Board that certain waterbodies be designated as Outstanding National Resource Waters (ONRWs). These shall be high quality waters which constitute an outstanding national resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance.

Designation of ONRWs must be made by the Water Quality Control Board and will be accomplished in accordance with Section 69-3-105(a)(1) of the Tennessee Water Quality Control Act and through the appropriate rulemaking process.

In surface waters designated by the Water Quality Control Board as ONRWs, no new discharges, expansions of existing discharges, or mixing zones will be permitted unless such

(Rule 1200-4-3-.06, continued)

activity will not result in measurable degradation of the water quality. Existing water quality will be the criteria in these waters. Physical alterations that cause degradation to the ONRW will not be allowed. At time of permit renewal, previously authorized discharges, including upstream discharges, which presently degrade an ONRW, will be subject to alternatives analysis. Public participation for these existing discharges will be provided in conjunction with permitting activities.

An assessment of environmental, economic, and social impacts will be prepared for each stream or stream segment proposed for ONRW designation. The assessment content and process will be determined by the department but will contain sufficient data and information to inform the Water Quality Control Board about environmental, economic, and social impact of ONRW designation. Further, the process will provide for comprehensive public participation with a solicitation of position statements from appropriate local government agencies including but not limited to county and municipal governments, Soil Conservation Districts, Utility Districts, as well as other local, state, and federal agencies that may have responsibility for land and water resource management within the watershed of the proposed stream segment.

The following streams or portions of streams are designated as ONRW:

WATERBODY	PORTION DESIGNATED AS ONRW
(a) Little River	Portion within Great Smoky Mountains National Park.
(b) Abrams Creek	Portion within Great Smoky Mountains National Park.
(c) West Prong Little Pigeon River	Portion within Great Smoky Mountains National Park upstream of Gatlinburg.
(d) Little Pigeon River	From the headwaters within Great Smoky Mountains National Park downstream to the confluence of Mill Branch.
(e) Big South Fork Cumberland River	Portion within Big South Fork National River and Recreation Area.
(f) Reelfoot Lake	Tennessee portion of the lake and its associated wetlands.

The portion of the Obed River that is designated as a federal wild and scenic river as of June 22, 1999 is designated as ONRW, provided however, that if the current search for a regional water supply by the Cumberland Plateau Regional Water Authority results in a determination that it is necessary to utilize the Obed River as its source of drinking water, for that purpose the Obed shall be designated as an Exceptional Tennessee Water and any permit issued for that project, whether state, federal, or otherwise, shall be considered under the requirements for Exceptional Tennessee Waters.

- (6) All discharges of municipal sewage, industrial waste, or other wastes shall receive the greatest degree of effluent reduction which the Commissioner of the Tennessee Department of Environment and Conservation determines to be achievable through application of stringent effluent limitations and schedules of compliance either promulgated by the Water Quality Control Board; required to implement any applicable water quality standards, including where practicable, a standard permitting no discharge of pollutants; necessary to

(Rule 1200-4-3-.06, continued)

comply with a State Water Quality Plan; or necessary to comply with other State or Federal laws or regulations.

- (7) In implementing the provisions of these rules as they relate to interstate streams, the Commissioner of the Tennessee Department of Environment and Conservation and the Tennessee Water Quality Control Board will cooperate with the appropriate Federal Agency in order to assist in carrying out responsibilities under the Federal Water Pollution Control Act, as amended.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule certified June 7, 1974. Amendment filed December 1, 1975; effective December 30, 1975. Amendment filed November 25, 1977; effective December 26, 1977. Amendment filed March 30, 1983; effective April 29, 1983. Amendment filed July 16, 1991; effective August 30, 1991. Amendment filed May 16, 1995; effective July 30, 1995. Amendment filed July 13, 1999; effective October 11, 1999. Amendment filed October 24, 2003; effective January 7, 2004. Amendment filed July 23, 2007; effective October 6, 2007.

1200-4-3-.07 GROUND WATER CLASSIFICATION.

(1) Purpose and Intent

- (a) It is one of the primary goals of the Tennessee Water Quality Control Act, Tennessee Code Annotated (T.C.A.) §§ 69-3-101 et seq. (the "Act") to protect our valuable ground water resource. This rule classifies ground water across the state based on the factors stated in T.C.A. § 69-3-105(a)(2) of the Act and establishes ground water quality criteria. The quality of ground water varies in Tennessee. Some ground water is sufficient to be used by our citizens directly as a drinking water supply with limited or no treatment. Other ground water would require more extensive treatment before it could be used as a water supply. Further, some ground water may be of such value as to warrant special protection. The board recognizes that some water below the surface of the ground may be present in a zone of aeration between ground surface and the water table. The zone of aeration is where treatment from household septic systems occurs and water in the zone of aeration is not classified as ground water in these regulations. Perched water above the zone of saturation may, in some areas, be used as a water supply or may migrate to either ground water or surface water and is included in these regulations to protect for its direct use or impact on ground water or surface water. Additionally, some ground water has levels of naturally occurring constituents that make the resource unusable as a drinking water supply.
- (b) The board recognizes these rules apply to both permitting activities and response actions that involve water beneath the surface of the ground. The permitting of underground injection is governed by Rule Chapter 1200-4-6.
- (c) These rules provide appropriate flexibility in the regulatory process to protect our ground water resource and to allow the productive use of land. Reuse of brownfield areas is encouraged and reduces the use of greenfield areas.
- (d) The board recognizes that several divisions within the department have a role in protecting ground water resources. It is not the intent of these rules to change the responsibilities of those programs. It is, however, the intent of these rules to provide a basis for decisions involving ground water that may be applied by all divisions of the department. The board does not intend these rules to affect in any way the ability of the State to seek natural resource damages from responsible parties when ground water has been contaminated by human activity.
- (e) Ground water that enters a stream or other water classified as surface water becomes surface water and is subject to respective criteria applicable to that water. The board

(Rule 1200-4-3-.07, continued)

expects that the department will use prudent judgment where ground water mixes with water on the surface of the ground.

(2) Definitions

- (a) "Area of Control" means a volume designated by the commissioner underlying or surrounding a site, including the zone of aeration and the zone of saturation, containing water, some of which the commissioner has determined not to meet applicable criteria.
- (b) "Ground Water" means water beneath the surface of the ground within the zone of saturation, whether or not flowing through known and definite channels..
- (c) "Perched water" means water that accumulates above an aquitard that limits downward migration where there is an unsaturated interval below it, between the aquitard and the zone of saturation.
- (d) "Point of Classification Change" means the boundary of the volume within which ground water is classified as Site Specific Impaired as established under Rule 1200-4-3-.09.
- (e) "Response action" means a clean up, remedial action, remedy, remedial investigation or other action taken by the department to address the presence of contaminants at levels that have been determined by the Department to require an appropriate response.
- (f) "Zone of Aeration" means a subsurface zone extending from the water table to the surface of the land.
- (g) "Zone of Saturation" means a subsurface zone below the water table in which all of the interconnected voids and pore spaces are filled with water

(3) Water in the Zone of Aeration

Water in the zone of aeration is not defined as ground water in this rule, but it may occur as perched water. This perched water may be above ground water of any of the classifications used in this rule. Perched water is protected under this rule in accordance with its use as follows:

- (a) Perched water that is used for drinking water or reasonably anticipated to be used as a drinking water supply shall meet the criteria listed for General Use in Rule 1200-4-3-.08(2). Other perched water shall not contain constituents, other than of natural origin, that cause or are reasonably likely to cause a violation of criteria of underlying ground water or surface water where the perched water enters those waters.
- (b) Except for naturally occurring levels, perched water shall contain no other constituents at levels and conditions that pose an unreasonable risk to public health or the environment.
- (c) If perched water, such as in a cave system, is habitat for fish and aquatic life, it shall contain no constituents except for naturally occurring substances at levels and concentrations that violate the criteria of Rule 1200-4-3-.03(3) for fish and aquatic life.

(4) Water below the surface of the ground is classified as follows:

- (a) Special Source Waters

(Rule 1200-4-3-.07, continued)

This is ground water or perched water with exceptional quality or quantity, which may serve as a valuable source for water supply or which is ecologically significant.

When the board finds water to be Special Source Water, then through the rulemaking process, the board will amend these rules to include the specific location and the boundaries of ground water or perched water designated as Special Source Water. To initiate this process, a petition shall address the factors listed below for board consideration. Any cost involved in making the petition shall be borne by the petitioner. In making this decision, the board may consider the following factors and relevant public input:

1. The vulnerability of the water in the proposed area to contamination due to hydrogeologic characteristics;
2. The number of persons or the proportion of the population using the water as a drinking water supply;
3. Existing water quality in the proposed Special Source Water area;
4. An evaluation of the ecological and environmental impact should the quality of the Special Source Water be compromised; and
5. Other pertinent information as deemed necessary by the petitioner, department, or board. Because such action is a rulemaking procedure, public input may be made as provided in the Uniform Administrative Procedures Act, T.C.A. §§ 4-5-201 et. seq., but not as a contested case under T.C.A. §§ 4-5-301 et. seq.

(b) General Use Ground Water

Except for ground water in areas that have been designated as Special Source Water, Site Specific Impaired Ground Water, or meet the definition of Unusable Ground Water, all ground water is designated General Use Ground Water.

(c) Site Specific Impaired Ground Water

This is ground water that has been contaminated by human activity and the board finds that either it is not technologically feasible to remediate the ground water to the criteria required by other classifications or it is not reasonable to remediate to that criteria based on information provided in accordance with Rule 1200-4-3-.09. Ground water shall be classified as Site Specific Impaired upon approval of a petition to the Water Quality Control Board and completion of the rulemaking process to amend these rules to identify the reclassified ground water. When ground water is reclassified to Site Specific Impaired the areal extent of the Site Specific Impaired Ground Water shall be delineated. The boundaries of the Site Specific Impaired Ground Water cannot extend beyond the perimeter and depth investigated with an appropriate safety factor as determined under Rule 1200-4-3-.09. Figures which clearly depict the horizontal and vertical boundaries of the Site Specific Impaired Ground Water must be submitted to the department in the plans/reports required by Rule 1200-4-3-.09.

(d) Unusable Ground Water

Ground water in the following areas are classified as Unusable Ground Water:

1. A "High Dissolved Solids Zone" is an area in which ground water has naturally occurring total dissolved solids of more than 10,000 ppm.

(Rule 1200-4-3-.07, continued)

2. A "Historical Injection Zone" is an area in which the ground water and the injection zone designated to receive fluids and other substances from deep well injection initiated prior to September 1985 and operated under compliance with the Department at the time of injection is no longer subject to injection. The certification as a historical injection zone subclass of Unusable Ground Water does not provide authorization for future injection activities and shall not be construed as Class I zone designation under Rule Chapter 1200-4-6, Underground Injection Control. The zone may be subsequently considered for Class I zone designation under that Rule Chapter provided it meets the criteria based on naturally occurring conditions and not from changes as a result of the previously injected fluids.
3. A "Class I Injection Zone" is an area in which ground water has been demonstrated by a permit applicant as a part of a Class I operation under Rule Chapter 1200-4-6, Underground Injection Control, to be suitable for Class I injection.
4. A "Class II or III Injection Zone" is an area in which ground water is mineral, hydrocarbon or geothermal energy producing, or has been demonstrated by a permit applicant as a part of a permit application for a Class II or III operation under Rule Chapter 1200-4-6 Underground Injection Control to contain minerals or hydrocarbons that, considering their quality and location, are expected to be commercially producible. The designation as Class II or III injection zone subclass of Unusable Ground Water shall not be construed as a Class I zone designation under Rule Chapter 1200-4-6, Underground Injection Control.
5. An "Acid Production Zone from Mining Activities" is an area in which ground water occurs within an excavated area where reaction with naturally occurring minerals generates acid rock drainage or acid mine drainage. An excavated area may be a surface or underground mined area as well as a subsidence area whether or not the mined area is backfilled. Ground water beyond the excavated area is classified as described elsewhere in this rule.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999. Repeal and new rule filed March 24, 2008; effective June 7, 2008.

1200-4-3-.08 CRITERIA.

The water quality criteria for the different classes are as follows:

(1) Special Source Water

The board will consider the special protection needs of any water identified as Special Source Water and promulgate criteria at the time of designation.

(2) General Use Ground Water

Except for naturally occurring levels, General Use Ground Water:

- (a) shall not contain constituents that exceed those levels specified in Rules 1200-4-3-.03(1)j and k; and
- (b) shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health or the environment.

(Rule 1200-4-3-.08, continued)

(3) Site Specific Impaired Ground Water

Except for naturally occurring levels, Site Specific Impaired Ground Water:

- (a) shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to public health or the environment;
- (b) shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health or the environment;
- (c) shall contain no constituents at levels that will prevent ground waters beyond the point of classification change from meeting the classification and criteria for those waters; and
- (d) other criteria established by the board as appropriate to the site.

(4) Unusable Ground Water

Except for naturally occurring levels, Unusable Ground Water:

- (a) shall contain no substances, whether alone or in combination with other substances, that are toxic, carcinogenic, mutagenic or teratogenic, other than those of natural origin, at levels and conditions which pose an unreasonable risk to the public health;
- (b) shall contain no other constituents at levels and conditions which pose an unreasonable risk to the public health;
- (c) shall not discharge to surface water causing a violation of surface water quality criteria or biological integrity; and
- (d) naturally occurring levels as used in subparagraph (a) of this paragraph shall include the natural minerals, mining wastes, and the reaction products of oxidation and reduction associated with these materials in Unusable Ground Water in an Acid Production Zone from Mining Activities. These substances shall not pose an unreasonable public health or safety risk to the public. Physical barriers and institutional controls satisfy that requirement.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999. Repeal and new rule filed March 24, 2008; effective June 7, 2008.

1200-4-3-.09 SITE SPECIFIC IMPAIRED CLASSIFICATION PETITION PROCESS.

- (1) Any person who encounters ground water that may meet the requirements for Site Specific Impaired, may petition the board to adopt a rule reclassifying that ground water as Site Specific Impaired, using the process set forth in this rule. Any costs involved in making the petition shall be borne by the petitioner. The petition shall include the following, unless it is determined by the department in writing that the site conditions render any of them unnecessary:
 - (a) An assessment of the horizontal and vertical extent of the contamination;

(Rule 1200-4-3-.09, continued)

- (b) An evaluation of the hydrogeology of the area including but not limited to the ground water flow rate and direction, permeability, recharge area, ground water classification and location of local water wells, springs and seeps;
- (c) An evaluation of the area geology including, but not limited to, soil type, soil permeability, soil porosity, depth to bedrock, and identification of geologic formations;
- (d) A description of the corrective actions or response actions taken or proposed;
- (e) The chemical characteristics of the constituents(s) including, but not limited to, the constituent's solubility, mobility, toxicity, and carcinogenicity, the nature of and the level of constituents to remain or be present in the ground water and the calculations and rationale used in the determination;
- (f) A feasibility study, which evaluates clean-up alternatives, the cost, and the time to complete each alternative;
- (g) An evaluation of current and reasonably anticipated future ground water use within the proposed Site Specific Impaired area and within a one-half (1/2) mile radius of the proposed Site Specific Impaired area; the impact of conduit flow shall be evaluated in karst areas;
- (h) An evaluation of current and reasonably anticipated future land uses within the proposed Site Specific Impaired area and within a one-half (1/2) mile radius of the proposed Site Specific Impaired area;
- (i) An evaluation of the potential of the constituent to migrate through soil and ground water to:
 - 1. homes;
 - 2. buildings;
 - 3. surface waters;
 - 4. subsurface utilities; and
 - 5. adjacent properties.
- (j) A description of any existing or proposed monitoring program to observe constituent levels in soil and ground water;
- (k) Evaluation of the existing or anticipated actual exposure pathways (inhalation, ingestion, dermal contact, etc.) of the constituents and an assessment of the human health risks presented by exposure to the constituents as well as the impact, if any, of the constituents on fish and aquatic life pursuant to Rule Chapter 1200-4-3;
- (l) Consideration of the classification in Rule 1200-4-3-.07 that would apply to the ground water at the site if it were not contaminated;
- (m) Analysis of the benefits of the restored resource;
- (n) A description of how and when the contamination occurred, if known;
- (o) A plat map with the proposed site-specific ground water area superimposed on it that shows all property owners for properties included in the Site Specific Impaired

(Rule 1200-4-3-.09, continued)

classification with contact information for owners of each property and identification and contact information for the parties paying property taxes on each property in the proposed Site Specific Impaired classification area; and

- (p) Other items as requested by the department associated with the evaluation of the petition.
- (2) Because Site Specific Impaired classification is a rulemaking procedure, public input may be made as provided in the Uniform Administrative Procedures Act, T.C.A. §§ 4-5-201 et. seq., but not as a contested case under T.C.A. 4-5-301 et. seq. In addition to the requirements for public input under the Uniform Administrative Procedures Act, T.C.A. §§ 4-5-201 et. seq., the petitioner shall, at a minimum, notify the party of record paying property taxes for each property subject to the Site Specific Impaired classification of the petition and the process for submitting comments on said petition. The petitioner shall provide a copy of such notification to the department.
- (3) In the evaluation of a petition to classify ground water as Site Specific Impaired, the board may consider the following:
- (a) the extent of any threat to human health or safety;
 - (b) the extent of damage to the environment;
 - (c) technology commercially available to accomplish restoration;
 - (d) a comparison of the environmental and economic costs and benefits to be derived from ground water quality restoration with the environmental and economic costs and benefits to be derived from classification as Site Specific Impaired;
 - (e) analysis of the restored resource;
 - (f) the point of classification change;
 - (g) contaminant or pollution source identification and cleanup;
 - (h) public comments; and
 - (i) other appropriate information presented in the petition.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999. Repeal and new rule filed March 24, 2008; effective June 7, 2008.

1200-4-3-.10 REMEDIATION OF GROUND WATER OR PERCHED WATER.

- (1) When a release or other event occurs that causes subsurface water to not meet the criteria in these rules, the commissioner has authority under a number of statutes to cause remediation of the water. These statutes include the Solid Waste Disposal Control Act, T.C.A. §§ 68-211-101 et seq., the Hazardous Waste Management Act, parts 1 and 2, T.C.A. §§ 68-212-101 et seq., and §§ 68-212-201 et seq., the Petroleum Underground Storage Tank Act, T.C.A. §§68-215-101 et seq., and the Drycleaner Environmental Response Act, T.C.A. §§ 68-217-101 et seq. The goals of all such remediation actions are:
- (a) to return waters to meeting standards when practicable by such methods as source removal, bioremediation, pump and treat, and natural attenuation; and

(Rule 1200-4-3-.10, continued)

- (b) to protect the public from exposure to water that does not meet standards through such methods as physical and institutional controls.
- (2) In order to accomplish these goals the commissioner may establish an Area of Control when contamination has caused water to exceed the standards in these rules. In establishing an Area of Control, the commissioner shall use the authorities of the remediation statutes and rules to:
 - (a) describe the extent of an Area of Control; and
 - (b) protect the public from exposure to the water in the Area of Control.

Where the commissioner identifies the source of pollution or water of sufficient contamination as to warrant contaminant mass reduction, he may further prescribe the actions to be taken to reduce the levels of contamination within the Area of Control.

- (3) The commissioner may establish such an Area of Control for water contaminated by human activity prior to November 19, 1980 if there are no liable parties as defined in T.C.A. § 68-212-202 (3) (B), (C), or (D) and the current property owner did not cause the water contamination. This could be done in conjunction with imposing land use restrictions to protect the public from any harm caused by the site whether or not the department expends funds to remediate the site. In establishing such an Area of Control, the commissioner may use the authorities of the remediation statutes and rules to:
 - (a) describe the extent of an Area of Control;
 - (b) prescribe the actions to be taken to reduce the levels of contamination within the Area of control; and
 - (c) protect the public from exposure to the water in the Area of Control.
- (4) Any current or future "alternate concentration limit" or "ground water protection standard" established within a Tennessee Hazardous Waste Management enforceable document in accordance with Tennessee Rule Chapter 1200-1-11-.06 identifies an Area of Control in accordance with this Rule. Compliance with the enforceable document constitutes compliance with the remediation actions identified in paragraph (1) of this Rule.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999. Repeal and new rule filed March 24, 2008; effective June 7, 2008.

1200-4-3-.11 CLASSIFIED SITE SPECIFIC IMPAIRED GROUND WATER AND RESPECTIVE CRITERIA.

The following ground water is classified as site specific impaired ground water with the respective criteria:

- (1) Porter Cable
 - (a) Description of the site

The area of ground water classified is the ground water within the boundaries of the Porter Cable/Rockwell facility that is within the rectangle with the following boundary points to a depth equivalent to 250 feet mean sea level.

Northwest boundary point...35°44'27.5"N, 88°51'19.8"W

(Rule 1200-4-3-.11, continued)

Northeast boundary point ...35°44'27.5"N, 88°51'05.7"W

Southwest boundary point...35°44'13.8"N, 88°51'19.8"W

Southeast boundary point... 35°44'13.8"N, 88°51'05.7"W

A solvent plume under the western edge of the building is moving very slowly to the north-northwest. Since the plant began operation in the mid-1970's, the plume has migrated approximately 400 feet, with the property boundary another 1500 feet down gradient. Sampling has shown that the plume is degrading to a certain extent by natural and biologic processes, and this process can be enhanced with the addition of nutrients to fuel the biologic activity in the contaminated zone.

(b) Criteria

Nutrient addition is allowed to promote enhanced natural attenuation of the plume in accordance with the remediation remedy being used at the site. Deed restrictions will insure the site will not be used as residential and that ground water will not be used for potable purposes. The point of classification change is totally within the boundaries of the Porter-Cable facility. The plume shall not cross the point of classification change at levels exceeding general use criteria.

(2) Isabella Mine Pit

(a) Description of the site

The area of ground water classified is the ground water in mined areas of the former Isabella/Eureka Mine, the connected Isabella pit, ground water between the Isabella pit and North Potato Creek, and an approximate 500 foot buffer around the mined areas. This ground water classification applies to part of the land that was previously abandoned by the bankruptcy court and is now either under control of a court-appointed receiver or trustee for the Irrevocable Trust of the Tennessee Chemical company (receiver or trustee). If the 500 foot buffer boundary would extend beyond a property line, then the property line shall be the point of classification change. The depth of ground water classification is from ground surface to 1400 feet. The mined areas are delineated as shown on the former mining company's mine maps. The point of classification change for this area is the outer boundary of the area classified as described above and a depth of 1400 feet.

There is a bulkhead or plug between the Isabella/Eureka Mine and the Burra Burra Mine and this Site Specific Impaired classification includes the drift between the Isabella and Burra Burra Mines on the Isabella side of the drift plug but does not apply to water in the Burra Burra Mine. The drift does not require a 500-foot wide buffer zone.

(b) Criteria

The Site Specific Impaired Ground Water criteria for the water in the Isabella pit, associated Isabella/Eureka mine workings, and ground water between the Isabella pit and North Potato Creek shall be:

1. Any concentration of inorganic constituents or elements associated with acid mine drainage and any pH or other physical standard associated with acid mine drainage;

(Rule 1200-4-3-.11, continued)

2. Any concentration of inorganic constituents or elements associated with approved backfilling or addition of ore, waste rock, calcine, concentrate, granulated slag, tailings, or other acid-generating materials from historic mining and ore beneficiation processes in the Copper Basin;
3. Criteria for other constituents are those required for General Use Ground Water as of November 3, 2004;
4. The continued use of institutional controls to avoid the potential for human contact with this ground water; and
5. Institute a monitoring program, acceptable to TDEC, that monitors the water level in the pit and is sufficient to assure protection of human health and the environment.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Administrative History:** Original rule filed June 28, 1999; effective September 11, 1999. Amendment filed July 13, 1999; effective October 11, 1999. Repeal and new rule filed March 24, 2008; effective June 7, 2008.

1200-4-3-.12 REPORTING REQUIREMENT.

- (1) The board acknowledges that the General Assembly has given it the authority to promulgate rules for the prevention, control, and abatement of pollution in T.C.A. § 69-3-105(b). The board finds a necessary first step toward controlling and abating pollution is becoming aware of the situation. This is especially needed in the case of ground water, as it is not in plain view as surface water often is. Furthermore, once the department has documents relating to an instance of pollution, they are generally going to be open to the public. Making the public aware of pollution both increases the likelihood that the pollution will be abated and that the public will be able to take appropriate action to reduce harmful exposure. These findings, in addition to the provision of T.C.A. § 69-3-114(b) making it unlawful to refuse to furnish any information required by the Board, are the basis for the requirement stated in paragraph (2) of this rule.
- (2) Owners or prospective purchasers of property used for commercial or industrial purposes who test the ground water or perched water on the property shall notify the commissioner of any contamination of such water if it is currently used as potable water and it exceeds general use criteria or if an environmental professional engaged by such owner or prospective purchaser reasonably concludes that it poses some other substantial risk to health or safety, including but not limited to, situations in which vapors released from the water are causing an explosion hazard or a current inhalation hazard with a hazard quotient of greater than 1 or a cancer risk of greater than 1×10^{-6} .
- (3) Routine sampling and reporting of ground water or perched water data required by an agency of the Department as part of a regulatory program obligation shall constitute reporting for the purposes of this rule.

Authority: T.C.A. §§4-5-201 et seq., and 69-3-105. **Authority:** Original rule filed March 24, 2008; effective June 7, 2008.